What is claimed is:

IrOx Method

1. A method for forming an iridium oxide solid, said method comprising the steps of:

exposing iridium metal to an alkali metal carbonate at a temperature sufficient to oxidize said iridium metal; and

applying a voltage between said iridium metal and said alkali metal carbonate so as to drive said oxidizing iridium metal toward a maximum oxidation state.

2. The method for forming an iridium oxide solid of claim 1, wherein said exposing of said iridium metal to said alkali metal carbonate is accomplished by a technique selected from the group consisting of: immersing said iridium metal in a bath of liquid alkali metal carbonate, applying liquid alkali metal carbonate to said iridium metal, depositing said iridium metal and said alkali metal carbonate sequentially and heating until one liquefies, bombarding said alkali metal carbonate with ions containing said iridium metal, bombarding said iridium metal with ions containing said alkali metal carbonate, condensing said alkali metal carbonate from a vapor phase onto said iridium metal, and condensing said iridium metal from a vapor phase onto said alkali metal carbonate.

3. The method for forming an iridium oxide solid of claim 1, wherein said application of a voltage between said iridium metal and said alkali metal carbonate is accomplished by a technique selected from the group consisting of: applying a galvanic potential across a bimetallic junction, utilizing the potential from a voltage-regulated power source

connecting said iridium metal and said alkali metal carbonate in a circuit, and utilizing the potential from a battery connecting said iridium metal and said alkali metal carbonate in a circuit.

4. The method for forming an iridium oxide solid of claim 1, further comprising the step of cleaning said iridium metal.

5. The method for forming an iridium oxide solid of claim 4, wherein said cleaning is accomplished by application of chemicals selected from the group consisting of: acetone, hydrochloric acid and de-ionized water.

6. The method for forming an iridium oxide solid of claim 1, further comprising the step of drying said iridium metal wire.

7. The method for forming an iridium oxide solid of claim 6, wherein said drying consists of drying said wire in an electric oven.

8. The method for forming an iridium oxide solid of claim 1, wherein said alkali metal carbonate is in powder form.

9. The method for forming an iridium oxide solid of claim 1, wherein said alkali metal carbonate is selected from the group consisting of: lithium carbonate and sodium carbonate.

10. The method for forming an iridium oxide solid of claim 1, further comprising the step of descumming said oxidized iridium metal.

11. The method for forming an iridium oxide solid of claim 1, wherein said iridium metal is oxidizes by ambient oxygen.

12. The method for forming an iridium oxide solid of claim 11, wherein said ambient oxygen is atmospheric oxygen.

IrOx electrode method

13. A method for forming an iridium oxide solid electrode, said method comprising the steps of:

forming an iridium oxide solid, said iridium oxide solid formed by the method of:

(i) exposing iridium metal to an alkali carbonate at a temperature sufficient to oxidize said iridium metal;

(ii) applying a voltage between said iridium metal and said alkali metal carbonate so as to drive said oxidizing iridium metal toward a maximum oxidation state; and

depositing said iridium oxide solid on at least one surface of an electrical lead, said electrical lead conductively attached to said iridium oxide solid.

14. A method for forming an iridium oxide solid electrode according to claim 13,

wherein said electrical lead is gold.

15. A method for forming an iridium oxide solid electrode according to claim 13, wherein said iridium metal is oxidized by ambient oxygen.

16. A method for forming an iridium oxide solid electrode according to claim 15, wherein said ambient oxygen is atmospheric oxygen.

17. A method for forming an iridium oxide solid electrode, said method comprising the steps of:

forming an iridium oxide solid, said iridium oxide solid formed by the method of:

(i) exposing iridium metal to an alkali carbonate at a temperature sufficient to oxidize said iridium metal;

(ii) applying a voltage between said iridium metal and said alkali metal carbonate so as to drive said oxidizing iridium metal toward a maximum oxidation state; and

depositing said iridium oxide solid on at least one surface of a metal substrate, said metal substrate conductively attached to said iridium oxide solid; and

conductively connecting an electrical lead to said metal substrate, so as to form an iridium oxide electrode.

18. A method for forming an iridium oxide solid electrode according to claim 17, wherein said metal substrate is iridium.

19. A method for forming an iridium oxide solid electrode according to claim 17, wherein said electrical lead is gold.

IrOx electrode apparatus

20. An iridium oxide solid electrode, comprising:

(a) said iridium oxide solid, said iridium oxide solid formed by the method of :

(i) exposing iridium metal to an alkali metal carbonate at a temperature sufficient to oxidize said iridium metal; and

(ii) applying a voltage between said iridium metal and said alkali metal carbonate so as to drive said oxidizing iridium metal toward a maximum oxidation state;

(b) an electrical lead, said electrical lead conductively attached to said iridium oxide solid.

21. An iridium oxide solid electrode of claim 20, wherein said electrical lead is gold.

22. An iridium oxide solid electrode, comprising:

(a) said iridium oxide solid, said iridium oxide solid formed by the method of:

(i) exposing iridium metal to an alkali metal carbonate at a temperature sufficient to oxidize said iridium metal;

(ii) applying a voltage between said iridium metal and said alkali metal carbonate so as to drive said oxidizing iridium metal toward a

maximum oxidation state;

(b) a metal substrate, said metal substrate having an outer surface that is at least partially coated by said iridium oxide solid; and

(c) an electrical lead, said electrical lead conductively attached to said metal substrate.

23. An iridium oxide solid electrode of claim 22, wherein said metal substrate is iridium.

24. An iridium oxide solid electrode of claim 22, wherein said electrical lead is gold.